

## **Flight Summary: WB-57F MidCiX – 22 April 2004**



Top: Cirrus cells observed during the Terra overpass. Bottom: Double halo over the Gulf of Mexico.

**Purpose of Mission:** Profile subtropical cirrus in support of Terra satellite observations.

### **General Information**

Flight date – 22 April 2004

Flight description – Flight #3, MidCiX mission, Terra cirrus validation

Flight duration – 6.1 hours

Crew – Steve Feaster and Brian Barnett

### **Weather Observations**

- A cutoff low pressure system over the eastern Pacific created a plume of cirrus that curved anticyclonically over old Mexico crossing Texas near Brownsville into the western Gulf of Mexico. The cirrus plume over Texas thinned during the flight while the clouds over the western Gulf were maintained by a weak disturbance in the southwesterly flow.

### **Flight Profile**

- We took off and climbed to FL 430 – FL 450 for the transit to the pre-determined box. Light turbulence was noted above the clouds at 16:11. Once we got to the box, we noticed the clouds had dissipated and adjusted the flight track to the north.
- We descended into the clouds on an east/west heading, entering the cloud tops at FL 330 at 16:27. No ground was visible. The top of the cloud layer was pretty well defined (bumpy in appearance), with lots of cloud wisps hanging out above the thick layer. We slowly descended to stay in the cloud tops, but flew through the wisps the majority of this run. The cloud layer thinned out at 16:47, FL 310, and a lower cloud deck was visible beneath us.
- At 16:52, slightly above the layer, “sub-visible” cirrus was noted, in that there were no visible clouds around us, but we were getting counts on CAPS, and the sky was turning color very slightly as “cirrus” went by.
- We turned back to the west and descended to FL 290 – FL 310 at 16:58. By 16:59, we were in thick cloud with no ground visible and the sky was attenuated. We were in and out of this thickness until 17:25, when it thinned out considerably. A halo around the sun was noted at 17:15. We quickly went back into the clouds for the satellite overpass.
- At 17:30 (**satellite pass time**), there was a halo with very vibrant colors noticed that looked like it was close to the aircraft, much further away from the sun than the previous halos. This occurred while we were in the cloud layer with the sky attenuated and the ground barely visible at FL 292.
- We then headed east to a point in the Gulf, but could not quite get there due to a hot warning area. We made it as far east as 27N, 96W before having to turn back to the west. We were in and out of the densest part of the

clouds for a couple of legs. A very dense cloud was noted at 18:10.

- At 18:16, we started a climb up to FL 350 to begin a spiral down.
- We were in clear air at FL 350, and started a slow spiral descent at 18:19:20. We entered the cloud top at FL 345, 18:20:30. At 18:22:30, we spiraled just under our own contrail.
- At 18:29:00, concentric halos were seen. The one furthest from the sun was very vibrant, but only last ~8 seconds, while the inner halo was not as bright, but persisted for a long while.
- At FL 300, the lower cloud deck beneath us became visible, with the sky slightly attenuated. There was still a halo, but basically just the red and yellow colors were visible.
- At FL 265, no blue sky was visible, but a halo was still around the sun. We bottomed out the cloud at FL 257, and continued to spiral down to FL 250. At this point, you could still not look at the sun – it was too bright, but the sky wasn't visible through the cloud layer.
- We immediately started a spiral up at 18:45:00 from FL 250. We were in clouds according to CAPS at FL 260, but visually, it looked like we were still below the cloud layer.
- Concentric halos were seen at 18:52:20 at FL 277.
- The best concentric halos were seen at 19:00:30 at FL 308. Both halos were extremely vibrant, and a good picture was taken.
- We got through the cloud layer at FL 320, but were in intermittent wisps up to FL 350. At FL 350, clouds were optically opaque. The spiral ended at 19:15.
- We conducted the MMS maneuvers because ATC was leaving us alone. Afterward, we descended down in the cloud to FL 300.
- At 19:27:50, we saw a rainbow streak slightly higher than the aircraft that showed the particles/droplets streaking through the color bands like water coming out of a car wash hose. This lasted 5-10 seconds.
- We got in a dense cloud at 19:42, FL 297, with no sky or ground visible. We flew out and back into another dense cloud at 19:57.
- We were alternating between the dense part of the cloud and the top of the cloud at FL 300.
- We stepped down to FL 293, to run a leg in the thicker part of the cloud.
- We then returned to base and climbed up to FL 450-490 at 20:24.
- During descent, we got into a thin cirrus layer between FL 280 – FL 250.
- At 3000', we flew for a long while in very wet, thick, puffy clouds. Liquid water was all over the airplane. This occurred at 21:02 and lasted a while.

#### **Flight Log**

<b>Take off</b>	1527 UTC	<b>Landing</b>	~2128 UTC
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#### **Instrument Failures/Notes/Times**

- The aircraft nav data recorder time started and zero and counted up. The recorder was turned on at 15:15:20.
- CIN fail light illuminated immediately. OFF – 15:32:00, ON – 15:32:05, OFF – 15:34:30, ON – 15:34:35, OFF – 15:35:35, ON 15:35:40, and left on the remainder of the flight. CIN did record good data during the flight.
- MMS Box: 19:15:55 – 19:19:50, 130 KIAS/FL347
- MMS Pitch: 19:12:50 – 19:14:07, 130 KIAS/FL347
- MMS Yaw: 19:14:30 – 19:15:07, 130 KIAS/FL347

Instruments flown: Nearly full compliment

Instruments not flown: JLH

Preliminary Instrument Notes:

Appears Good: MMS, CAPS, CSI, CPI, NEV, SPP, Harvard TW, Harvard WV, CLH, CIN

Poor Data: VIPS, PIP/2DP

#### **Nav Data Information**

- IP Address: 139.169.70.28
- User Name: [anonymous@wb57f.asds.net](mailto:anonymous@wb57f.asds.net)
- Password: <any email address>

Compiled by Brian Barnett, Jay Mace